

AMENDMENTS TO THE CLAIMS

Please amend claims 1, 13 and 19, and cancel claims 4, 7, 10, 15, 17, 18, 22, and 24 without commenting on or conceding the merits of the rejections of these claims, and without prejudice to pursuing these claims in a continuation or other application. Please add new claims 27 and 28 as indicated in the following listing of pending claims.

1. (Currently Amended) A system for detecting icing conditions external to a vehicle, comprising:

a housing having a flow channel positioned along a flow axis, the flow channel having an entrance and an exit positioned to receive an airstream;

a probe having a first surface positioned to face toward the airstream as the airstream travels along the flow axis, the probe further having a second surface facing opposite from the first surface;

a temperature sensor carried by the probe and positioned in the flow channel along the flow axis between the entrance and the exit, the temperature sensor being positioned to face downstream at least proximate to the second surface of the probe, the temperature sensor being configured to direct a first signal corresponding to a temperature of an the airstream;

a water content sensor carried by the probe and positioned in the flow channel along the flow axis between the entrance and the exit, the water content sensor being configured to direct a second signal corresponding to a water content of the airstream; and

a processing unit coupled to the temperature sensor and the water content sensor to receive the first and second signals and, based on at least the first and second signals, provide an indication when at least the first and second signals taken together correspond to an at least incipient icing condition.

2. (Original) The system of claim 1 wherein the water content sensor includes at least one of a liquid water content sensor, a total water content sensor and an ice crystal sensor.

3. (Original) The system of claim 1 wherein the temperature sensor, the water content sensor and the processing unit are configured to mount to an aircraft.

4. (Canceled)

5. (Original) The system of claim 1 wherein the water content sensor includes a heated wire positioned to be impinged by water contained in the airstream.

6. (Original) The system of claim 1 wherein the processing unit is configured to provide a positive indication of an at least incipient icing condition when the temperature sensor detects a temperature corresponding to a static temperature at or below a local freezing point for water, and the water content sensor detects liquid water.

7. (Canceled)

8. (Original) The system of claim 1 wherein the temperature sensor is configured to detect a total temperature of the airstream.

9. (Original) The system of claim 1 wherein the temperature sensor is configured to detect a total temperature of the airstream, and wherein the processing unit is configured to determine a static temperature of the airstream based at least in part on the first signal.

10. (Canceled)

11. (Original) The system of claim 1 wherein the processing unit is operatively couplable to a pressure sensor to receive a third signal corresponding to a pressure of the airstream, and wherein the processing unit is configured to provide the indication based on the first, second and third signals.

12. (Original) The system of claim 1, further comprising an aircraft having a fuselage portion, a wing portion, an empennage portion and a propulsion system, and wherein each of the temperature sensor, the water content sensor and the processing unit is carried by at least one of the fuselage portion, the wing portion, the empennage portion and the propulsion system.

13. (Currently Amended) A system for detecting icing conditions external to a vehicle, comprising:

a housing having a flow channel positioned along a flow axis, the flow channel having an entrance and an exit positioned to receive an airstream;

a probe having a first surface positioned to face toward the airstream as the airstream travels along the flow axis, the probe further having a second surface facing opposite from the first surface;

temperature sensing means configured to sense a temperature of an airstream and direct a first signal corresponding to the temperature, the temperature sensing means being carried by the probe and positioned in the flow channel along the flow axis between the entrance and the exit, the temperature sensing means being positioned to face downstream at least proximate to the second surface of the probe;

water content sensing means carried by the probe and positioned in the flow channel along the flow axis between the entrance and the exit, the water content sensing means being configured to sense a water content of the airstream and direct a second signal corresponding to the water content;
and

processing means coupled to the temperature sensing means and the water content sensing means and configured to receive the first and second signals and, based at least on the first and second signals, provide an indication when at least the first and second signals taken together correspond to an at least incipient icing condition.

14. (Original) The system of claim 13 wherein the temperature sensing means, the water content sensing means and the processing means are configured to mount to an aircraft.

15. (Canceled)

16. (Original) The system of claim 13 wherein the processing means is configured to provide a positive indication of an at least incipient icing condition when the temperature sensing means detects a temperature corresponding to a static temperature at or below a local freezing point for water, and the water content sensing means detects liquid water.

17. (Canceled)

18. (Canceled)

19. (Currently Amended) A method for detecting icing conditions external to a vehicle, comprising:

receiving signals from a device carried external to the vehicle, the device including:
a housing having a flow channel positioned along a flow axis, the flow channel having an entrance and an exit positioned to receive an airstream;

a probe having a first surface positioned to face toward the airstream as the airstream travels along the flow axis, the probe further having a second surface facing opposite from the first surface;
a temperature sensor carried by the probe and positioned in the flow channel along the flow axis between the entrance and the exit, the temperature sensor being positioned to face downstream at least proximate to the second surface of the probe, and being configured to direct a first signal corresponding to a temperature of the airstream;
a water content sensor carried by the probe and positioned in the flow channel along the flow axis between the entrance and the exit, the water content sensor being configured to direct a second signal corresponding to a water content of the airstream, wherein receiving signals includes
receiving a first signal from the temperature sensor corresponding to a temperature of an airstream external to a vehicle;
receiving a second signal from the water content sensor corresponding to a water content of the airstream; and
based on at least the first and second signals, automatically generating an indication when at least the first and second signals taken together correspond to an at least incipient icing condition.

20. (Original) The method of claim 19 wherein receiving the second signal includes receiving the second signal from at least one of a liquid water content sensor, a total water content sensor and an ice crystal sensor.

21. (Original) The method of claim 19 wherein the processes of receiving the first signal, receiving the second signal and automatically generating an indication of claim are performed on board an aircraft.

22. (Canceled)

23. (Original) The method of claim 19, further comprising:
determining when the temperature sensor detects a temperature corresponding to a static temperature at or below a local freezing point for water;
determining when the water content sensor detects liquid water; and
generating the indication only when both the temperature sensor detects a temperature corresponding to a static temperature at or below a local freezing point for water and the water content sensor detects liquid water.

24. (Canceled)

25. (Original) The method of claim 19 wherein receiving a first signal includes receiving a first signal corresponding to a total temperature of the airstream, and wherein the method further comprises determining a static temperature of the airstream based at least in part on the first signal.

26. (Original) The method of claim 19, further comprising:
receiving a third signal corresponding to a pressure of the airstream; and
determining whether the first signal corresponds to a temperature at or below which water freezes, based on the first signal and the third signal.

27. (New) The system of claim 1 wherein the temperature sensor includes a static temperature sensor.

28. (New) The system of claim 1 wherein the flow axis is a generally straight flow axis between the entrance and the exit.